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ABSTRACT

This paper describes the rationale behind and the development and utilization of a bibliographic instruction course which incorporates formal abstract reasoning skills. The limitations of the search strategy technique of bibliographic instruction are discussed as well as the fact that many college students have not developed sophisticated reasoning skills. Three components of the course designed to incorporate these skills are described, including: (1) analysis of a research problem; (2) linkage or determining the interrelationships between reference tools and the materials they locate; and (3) evaluation of sources. The teaching techniques used to develop reasoning skills are also discussed--specifically, the adaptation of bibliographic instruction to the learning cycle, and the utilization of a guided design technique which gives students an open-ended problem and takes them through a series of problem-solving steps paralleling the decision making process. The use of this bibliographic instruction course in a Freshman Abstract Reasoning (FAR) program at the College of Charleston and also with non-FAR students is described. Finally the paper presents sample course exercises which teach question analysis, problem identification, source identification, and source evaluation. A 15-item bibliography is provided. (ESR)

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PETALS AROUND A ROSE:
ABSTRACT REASONING AND BIBLIOGRAPHIC INSTRUCTION

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A PAPER PRESENTED BY
CERISE OBERMAN-SOROKA

IN THE PROGRAM
"LEARNING THEORY IN ACTION:
APPLICATIONS IN BIBLIOGRAPHIC INSTRUCTION"
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

I had a feeling that the most intriguing part of my talk would be the title. I was tempted not to reveal its meaning until the last sentence of my presentation. Instead, I am going to let you discover its meaning now by playing a game. The name of the game, as you might have guessed, is Petals Around A Rose.

Petals Around A Rose is a dice game. There is one clue to the game: the name of the game tells you, more or less, how the game is played. There is one rule to the game: the game is played against yourself, not other people, so you never reveal the solution to anyone else. Once you have solved the problem you let the table coordinator know by simply giving the correct answer, several times. Each table has a coordinator who will lead you in the game--I'll give you about five minutes to play.

You have just been involved in an exercise which challenges your abilities to try new patterns of thinking when old patterns are not workable. If your reaction has been anything like mine was when I first tried this, you have been totally engrossed in this game and will probably continue to work on it after this program. At the very least, the solution will haunt you for sometime. Those of you who may have found the solution quickly,may be surprised at the simplicity of the game. Don't be misled; the process you have just experienced, although you may not be aware of it, is the process of self-regulation. What is both exciting and shocking about this, is that it is a learning experience.

This simple game illustrates a complex and elaborate theory of education. It is that theory of education based on abstract reasoning, and its application to library instruction which I would like to share with you.

Before an educational theory can be conveniently plugged into our needs, it is

essential that we re-structure our own perception of library instruction. Bibliographic instruction has experienced a natural and positive progression from a single emphasis on subject content to one of pedagogical concern. Although it is apparent that there has been a significant philosophical shift from a simple attempt to acquaint people with sources to a more complex concern with how sources are used, and how they are taught, we still are not totally at ease with the role of library instruction in the educational system.

Initial attempts at library instruction took the form of the orientation tour. The standard orientation tour, or as I call it, "The Herding Technique," quickly gave way to a more informational approach when it was apparent that librarians had more to instruct students about than the physical structure of the library. The introduction of particular sources through bibliographies, audio-visual presentations, or workbooks, characterizes the next development in library instruction--tool orientation. This approach clearly signified the educational value of library instruction, but it gave little attention to tool linkage; students could not effectively make use of the lists of sources which they had. Thus, the search strategy technique which stresses process, or how to get from point A to Z, was the next logical step for B.I. Process demanded more explanation than tools, and therefore, the standard lecture, text materials, and workbook materials became the conveyors of this information. We were now clearly in the business of educating. But, although the process approach is a good practical approach to teaching library research, I am not altogther satisfied with this approach: First, this approach to research is not transferable since it usually is explained in terms of a single search strategy, a set pattern which should flow in a smooth and undisturbed line from encyclopedia to handbooks. etc. This pattern is often not applicable to different disciplines, and most disturbing, it often misrepresents the process of effective research which should remain flexible and unstructured, rather than set and inflexible.

Second, evaluation of sources is rarely dealt with. Knowledge of individual tools, even when linked together by a flow chart, does not necessarily mean that students can effectively evaluate the relative value of those tools in relation to their research problem, or that they can evaluate the source material they locate using those tools.

And finally, the search strategy approach often does not deal with the crucial beginning point--the research problem itself. Students are not able to dissect their research problem in a way that allows them to understand what types of resource tools will benefit them most.

These three points represent my reservations about what has become a standard approach to bibliographic instruction; a process approach teaches students skills, set patterns of thought rather than flexible methods. We should not only be teaching a flexible approach to research problems, since methods and patterns necessarily change depending on the research problem and the limitations of a research facility, but we should be insuring that students can alter their research methods when appropriate. It was in this context, and with some yet unarticulated need for an educational, theoretical base, that I began to re-examine the goals and objectives of my own library course, which is a required one-hour credit course.

What I discovered was that I too was emphasizing a strict process of research with little attention to either the substantive content of materials or the need for a transferable methodology. After considerable thought and experimentation, I finally began to organize my course on three basic components:

ANALYSIS: The ability to dissect a research problem; to identify the type of information needed to answer the problem in order to identify and locate materials which will best provide that information;

LINKAGE: The ability to understand the interrelationship between reference materials and the sources which they locate for effective manipulation and facilitation of research;

EVALUATION: The ability to recognize not only a need to evaluate materials but the ability to establish evaluation criteria to apply to source materials.

When these three components of library research form the core of library user education, then research becomes less of a mechanical process which relies on individual tools, and more of a thought process which relies on the understanding of information generation, structure, and retrieval.

When I committed myself to re-structuring my library research methods course based on these components, little did I realize that I was embarking on my own learning experience. In the midst of my rewriting, reorganizing, and re-evaluating my course, I was fortunate to attend a two day seminar conducted by several faculty members from the University of Nebraska who were presenting an experimental program, called ADAPT, an acronym for Accent on Developing Abstract Processes of Thought. This seminar not only had an enormous and substantial effect on my approach to education, but supplied a theory of learning and an apporach to teaching which complemented my new course design.

The theory behind the ADAPT program is based on the concept of the development of reasoning. Reasoning, or the ability to reason, is a complex process which, according to Jean Piaget, noted authority on child psychology, is a natural cognitive process which reaches maturation in the adolescent years. Piaget identified four stages of cognitive development; an infant is at the sensory motor stage which is characterized by the child's interaction with the physical environment; by age two, as a child begins to acquire language and objects are named, the child moves into the pre-operational

thought stage; when objects can be generalized to the symbolic level, the child has reached the concrete reasoning stage. Concrete reasoning is reasoning which makes use of direct experience, concrete objects, and familiar actions; problem solving is done by association. By the time a child reaches the ages of eleven to sixteen, the transition from concrete reasoning to formal reasoning should be complete. Formal reasoning is characterized by thought processes of increasing flexibility which allow for formulation and testing of a variety of alternative hypotheses when an individual is confronted by a problem. No longer is a child dependent on concrete experiences solely; all possibilities of a situation, concrete and abstract, can now be considered.

"Petal Around A Rose" is a simple game which illustrates what formal reasoning is and how it is used in problem-solving. The game is designed to "upset your equilbrium" thus, forcing you to be flexible and test a variety of alternative solutions in order to solve the problem. Many of you, I am sure, thought you had the solution, probably a number of times before you actually did. The process of formulating a hypothesis, testing it, and discarding it when it is found not to be useable, is called self-regulation. During self-regulation, you are searching for relationships and patterns which will be used in solving a given problem; you are involved in formal operational thinking.

I have observed here and elsewhere that the level of participant frustration while playing "Petals Around a Rose" is fairly high. I also know from my first attempt at this game, that the feelings of frustration are directly proportional to the number of people who solve the problem before you do. Now put yourself in a student's situation--in a classroom, faced with a similarly complex concept that requires the use of formal reasoning. If a student is unable to function at this level of thinking, they then experience the same feelings of inadequacies that you may have just experienced. And if the teaching technique itself does not invoke the use of formal reasoning, as

"Petals Around a Rose" did, then the classroom may become an actual inhibitor to learning.

Despite Piaget's belief that a person of sixteen should be functioning at the formal level of reasoning, numerous studies report that fifty to eighty-five percent of college freshmen are unable to function at the formal operational level of reasoning. Yet, as college teachers, we expect students to function at a reasoning level that most have not yet reached. More discouraging, studies indicate that the typical freshman year experience does not significantly upgrade the reasoning patterns of students.

Students then, not only need to learn subject matter, but, I would suggest, more importantly, they need to be taught how to think, how to reason at the formal level, and how to do problem-solving. Studies show this can indeed be done. The very basis of my research methods course, with its emphasis on the concepts of analysis, linkage, and evaluation, is designed to encourage students to function at a formal reasoning level.

My attempt to merge library research instruction with the apparent need to teach students how to reason effectively resulted in my developing a course design modeled on two particular teaching techniques. These techniques share several common elements:

1. They both present subject content in a structure explicitly designed to promote the use of self-regulation and the development of reasoning skills;

2. They both stress the need for group interaction; all class work is done in small groups, as well as much of the out-of-class assignments. Group work encourages active participation in learning, stimulates discussion, and facilitates learning for students who may be at the concrete reasoning stage;

3. Each of the two models is non-subject specific; the models themselves are only a

skeleton of steps which are designed to encourage the use of reasoning abilities;

4. Each model has been successfully adapted and used by a wide variety of disciplines.

I would like to spend the next few minutes explaining the theoretical structure of the two teaching techniques which I use. If it seems a bit abstract, please bear with me, I'm sure it will all become clearer when you work with the actual materials in a few minutes.

The first teaching technique which I began to adapt to library instruction was the learning cycle. This technique was first developed by Robert Karplus, and then later adopted by the University of Nebraska ADAPT program. The learning cycle is a three step module which consists of 1) exploration; 2) invention; and 3) discovery or application. Each step is designed to make optimal use of reasoning abilities.

Exploration is the first phase of the learning cycle. This stage introduces students to new materials and ideas by encouraging them to find patterns, draw relationships, etc. with minimal guidance. Students should be faced with a situation which demands self-regulation.

The second phase is invention. This stage introduces or explains the concepts or principles that students have unknowingly worked on in the exploration stage. It is at this point that a formal vocabulary, or clarification of the exploration stage occurs. Additional work, or expansion of concepts might be introduced at this time.

The final phase of the learning cycle is referred to as the discovery or application stage. The concepts which are explored in the first two stages are now used and applied in an assignment. This final stage serves two purposes: Reinforcement of a concept and transference of a concept to a new situation.

You will all have a chance to work on a question analysis learning cycle that I have designed in a few minutes.

The other teaching technique which I use is guided design. This reasoning based instructional technique was developed and popularized by Charles Wales and Robert Stager of West Virginia University in Morgantown. They first developed the guided design concept for use in their engineering program in 1970, and this year they held the first national conference on guided design.

The development of a guided design is a slightly more elaborate task than the construction of a learning cycle. However, it seems to serve as a better vehicle to present particularly complex or numerous concepts at one time since it is a multi-step process which requires the articulation of the numerous steps identified as essential to the decision-making process.

The construction of a guided design is based on an open-ended problem which allows students to work freely and creatively toward a solution. The problem is presented in a series of steps which parallel the decision making process as outlined by Wales. Students deal with each step as it is given and do not proceed to the next step until they have demonstrated their ability to cope with the preceeding one. Interface takes place between student groups and the instructor through both personal communication and feedback statements.

The steps which are stressed in decision-making and which are mirrored in the guided design are specific:

1. Identification of the problem;
2. The basic goal to be reached;

3. The constraints, assumptions, and/or facts of the problem
4. The possible solutions to the problem;
5. Evaluation of the possible solutions;
6. Analysis;
7. Synthesis;
8. Evaluation of the solution;
9. Recommendations.

In a few minutes you will have a chance to work through a guided design written to introduce the concept of evaluation of sources and encyclopedias.

I have been working with both guided design and learning cycles for about three years now. Last Spring, five faculty members at the College of Charlestown applied for and received a two year National Science Foundation Grant to design and implement a set of coordinated freshman courses which stress the development of reasoning skills. We named our program FAR (Freshman Abstract Reasoning) program. Currently there are five disciplines involved: economics, sociology, astronomy, mathematics, and research methods. This Fall, biology will be joining us. The purpose of this program is to try to implement and establish the impact of a group of concentrated courses stressing reasoning on a selected group of freshmen.

The FAR library course serves as the core course for the FAR program. All students enrolled in FAR must be enrolled in FAR Library 101 for one of the two semesters. The FAR library course concentrates on the preparation of a selective bibliography for a particular research problem which is drawn from the other courses in the FAR curriculum. The research process unfolds over seven weeks as students are introduced to the various stages of research in class and then apply these concepts to their research topic.

The final four classes of the FAR library course are spent on a multi-disciplinary guided design project prepared by the entire FAR faculty. It is a means of demonstrating how the same cognitive processes are used by different disciplines. In addition, it demonstrates how several disciplines are often essential in solving one problem. This final guided design represents the culmination of the students' substantive and bibliographical knowledge. The final exam for Library 101 is the compilation of a selective scholarly bibliography based on the open-ended research problem posed in the guided design. In addition to the bibliography, students must also attach a narrative of their search process, the reference materials selected and discarded, the process of evaluation used for selection of materials, and a final assessment of the quantity and quality of materials found on the research topic.

While the FAR library course has several benefits derived from being part of a unified program, particularly the concentration and coordination of subject matter and teaching techniques, I am convinced that there needs to be more attention paid to this pedagogical approach within traditional curriculums. And this can be done. I started developing learning cycles and guided designs for use in the classroom well before I became part of this grant.

I have taught Library 101 for four years now. For the last two years I have used some of the same teaching techniques which I now use exclusively. I must admit that both FAR and non-FAR students are often initially apprehensive about these different teaching techniques. I am sure they would feel much more secure listening to a lecture on the first day of class rather than arranging themselves in small groups and collectively solving a problem. Naturally, FAR students are indoctrinated much quicker into this technique since they are experiencing it in several classes.

Interestingly, it is the non-FAR students who truly relish this change and variation in teaching technique; they often comment in their semester-end evaluations on the refreshing and innovative approach of the class.

Actively involving students in the learning experience, letting them discover and explore on their own, seems to generate enthusiasm and interest. This in-class enthusiasm tends to carry over to out-of-class assignments. Perhaps the group work, a basic part of this apprach, instills a certain amount of collective responsibility--one student helping another--which may in turn aid motivation.

More importantly, perhaps, students are exposed to teaching techniques which require them to "think." Ideally, these teaching techniques demand abandoning set reasoning patterns and require the adoption of new flexible thought processes. At the very least, these teaching techniques create the opportunity for students to begin to exhibit a greater responsibility in the learning process.

If library instruction is searching for an educational theory, then it seems that we must do two things: 1) Examine our goals and objectives--what and why are we teaching? Do we want to become a true part of the educational framework? Are we willing to assume responsibility for developing the thinking abilities of our students? 2) What type of educational theory can offer us the philosophy and approach that is consistent with our efforts?

I have found that in a course which stresses the development of a methodology, that the development of reasoning ability is a natural and essential part of my purpose. The teaching techniques which allow me to merge subject content and reasoning skills has made me broaden my perspective on the role of the librarian as teacher and educator. There is a definite place for theory in library instruction.

Questions for Learning Cycle

Define a "hippogriff."

In what state is the Hudson River located?

How much rainfall did Charleston receive in May, 1976?

Compare the number of deaths in the United States attributed to homicide, automobile accidents, and heart attacks.

Recently, the U.S. Congress passed a law which put aside thousands of acres of land in Alaska as wilderness areas. How much land is involved and who was responsible for introducting this legislation?

The current gas shortage has been caused by American's overconsumption. Do you agree or disagree?

The concept of "manifest destiny" was often cited as an excuse for the destruction and removal of the Indian nations during the period of this country's western expansion. Explore this issue.

Is there a relationship between unemployment and recession?

EXPLORATION

Each card in your packet has a research problem written on it. Sort the cards into two piles (sets) according to the type of answer you would need to satisfy the question.

2. State how the cards in each pile resemble each other and how they are different.

   Pile 1:

   Pile 2:

3. Can you make a further distinction from either Pile 1 or Pile 2 based on the complexity of the questions? What distinguishes your third pile?

INVENTION

You have identified three distinct types of questions using the process of question analysis. The three types of questions you have identified are: simple, compound, complex. These terms are most often applied to sentence structures, but in question analysis they take on a slightly different meaning.

The SIMPLE QUESTION asks for only one fact and therefore requires the use of one fact tool.

The COMPOUND QUESTION asks for two or more facts and therefore, may require one or more fact tools to locate the answer.

The COMPLEX QUESTION asks for both facts and concepts; fact tools alone will not satisfy the question so finding tools must also be consulted.

I. There are fact and finding tools for all different disciplines. Once you decided which types of tools you need, you must decide which disciplines your question encompasses.

Select one complex question from your packet;

A. What type of subject matter is covered? (disciplines)

B. What is the scope of this research problem?

C. Does this research problem need to be narrowed?

D. If yes, how could you narrow it?

II. Pose some questions that you need to ask before beginning research on this research problem.

III. What types of tools would you need to answer these questions?

Define a "fact tool" in one sentence.

Define a "finding tool in one sentence.

APPLICATION:

Choose one of the following research topics. (You will use this topic for several assignments, so choose a topic that you are interested in researching.) Read the question carefully and then answer the questions on this page without going to the library.

a. What disciplines need to be considered in this question?

b. Identify the key words in your research problem.

c. Is the scope of your question too broad or too narrow? How can you rectify this.

d. Generate a list of ten questions which you need to pose to give direction to your research.

e. What formats of materials (e.g. books, encyclopedias, etc.) would you expect to locate the type of information you are seeking? Categorize these into fact or finding tools.

f. Create names of research tools that you would like to have available to you to answer the research problem.

THE SETTING--PROBLEM SITUATION

It was the sixth week in the semester when Louis realized that he had not yet started to prepare the fifteen minute oral presentation which was due in just three days. The topic was "Briefly summarize the numerous reasons why the United States reversed its diplomatic stance regarding Red China." He was in a panic. Louis not only disliked the subject of his assigned report, but he did not know anything about China much less the reasons why the United States had decided to finally recognize China. Worst of all, he did not have the faintest idea where he could find all the information he needed to write a paper in such a limited time. He had completed one research paper for another course, but he had had a book at home on that topic. Now, facing an unknown subject and an unyielding time limit, he did not know where to turn.

He thought of approaching his teacher, but at this point he was just too embarrassed. Out of desperation, he called Maggie, his peer advisor who he had met during orientation week. Maggie had been really helpful with registration and classes, maybe she would know how to prepare an oral report quickly. Maggie was glad to hear from Louis and suggested that they meet and discuss what Louis could do.

INSTRUCTION A--IDENTIFY THE PROBLEM

When Louis arrived at the snack bar to meet Maggie, he found that she was discussing the issue of the United States' recognition of China with several of her friends. This immediately made Louis feel better; they certainly could give him some suggestions. When Louis joined the group, Maggie directed the conversation to Louis' problem.

Deborah said that she knew something about the reasons the United Stated decided to recognize China -- perhaps he could use what she knew. But Kandy disagreeded with everything she said. Maggie quickly interjected, "I really don't think that Louis can use either of you as quality source material, so stop arguing and let's help Louis solve his problem."

Deborah suggested that Louis approach his teacher, but Louis immediately rejected that idea. Randy said that someone in the political science department might be helpful, but Louis replied that he didn't have time to find a teacher who would probably just suggest a book for him to read. Maggie finally suggested that they make a list of all possible sources, places, people, etc. which are available to Louis.

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FEEDBACK A

The group's list included the following information sources:

Louis' teacher
a political science teacher
other students in the course
librarian
books
magazines
library
encyclopedias
newspapers

INSTRUCTION B - IDENTIFY THE PROBLEM

Louis glanced at the list, "I definitely will not go to my teacher, and I feel dumb going to the library--I have never been in there. I think my best bet is to find a few articles in TIME or NEWSWEEK. What do the rest of you think?

"I thinkg that there has been so much written about China," Randy replied, "that you may have difficulty finding the best articles to read. Furthermore, it seems to me that you need some background information which will give you a brief history of the events leading up to the decision."

Maggie interrupted, "That's the key--the real problem is where Louis can find some background information which will point out events and key issues."

"That sound just like the kind of information I need," Louis was quick to say, "but where can I find it?"

"Even though you have never been in the library," Randy offered, "that would obviously be the best place to start."

"Okay, but the library has tons of different kinds of material, what do I look for?" Louis questioned.

"Let's narrow our list of sources to those we know are in the library," Deborah suggested. "That should help us.

"It might be helpful for Louis if we also defined each source we identify," Randy added.

FEEDBACK B

The group listed all the types of sources that they were familiar with and defined them:

books

magazines: a publication issued on a regular basis and typically containing stories, essays, etc. by a number of writers. Magazines may specialize in a particular subject or area.

journals: a publication issued on a regular basis and frequently published by and for a learned society or profession.

newspapers: a publication usually issued daily or weekly commonly containing news, features, photographs, and advertising

encyclopedias: a book or set of books which includes articles on a broad range of subjects

INSTRUCTION C - CONSTRAINTS

"Gosh, I still don't know which one of these sources is the best place to find what I need," Louis said wearily.

"Well," Maggie said, "you need something recent, don't you?"

Louis nodded.

"Well then," Randy offered, "that's one criteria for choosing the proper source. Certainly there are others as well."

"I know one other--I need something fast," Louis joked.

Help the group make a list of criteria (standards used for judgment) which Louis needs to consider before he chooses his sources.)

FEEDBACK C

The group thought for a while and finally made the following list outlining things which Louis needed to take into consideration:

Currency: Louis needs current information

Retrieval (Time): Louis needs information which is easy to retrieve

Accuracy: There have been so many opinions expressed on this subject--you want material written by someone qualified

Level of information: Louis needs both facts and concepts presented at a level which he can understand

Breadth: Louis needs sources which will give him a overview of the question at hand

INFORMATION D - ANALYSIS

"This is a good list. Let's make a chart so we can evaluate our list of sources available in the library against our criteria," Maggie urged.

	retrieval	accuracy	currency	level of information	breadth
magazine					
encyclopedia					
newspaper					
book					
journal					

Using this chart rate each source from 1 (standing for "easiest" or "most") to 5 (standing for "hardest" or "least"). Add any additional sources that your group considered as possible sources of information. (The same number can be used more than once.)

FEEDBACK D

While the group worked on rating the list, Maggie took a copy of their chart to Mr. Sanders, a librarian who was a friend of hers. Mr. Sanders thought the chart was good, and suggested that they add an additional criteria--the presence of a bibliography. He explained that that could help in determining the original source of the information in an article, or book, and might be helpful in following up on additional information. Maggie returned with the chart Mr. Sanders had filled in.

	retrieval	accuracy	currency	level of info.	breadth	presence of bibliography
magazine	3	3	1	2	4	NO
encyclopedia	1	2	3	1	1	YES
newspaper	3	4	1	1	4	NO
book	2	2	4	3	1	YES
journal	3	1	3	5	5	YES

INSTRUCTION E--Evaluation

Maggie remarked, "It seems that magazines or newspaper are your best bet--they are both so current."

"But," Louis interjected, "they don't seem to be very accurate, and they are a lot harder to locate than an encyclopedia."

"Anyway," Randy added, "encyclopedias seem to have the level of information that Louis needs at this point. I suggest that you start there Louis."

Deborah argued, "I still think accuracy is the most important thing that you need to be concerned with, Louis. And a journal is the best place to find accurate information."

Randy retorted, "Sure, a journal is accurate, but journal articles tend to concentrate on specific incident, or aspect of an issue, rather than the broad overview."

If you were Louis, which source would you pick and why?

FEEDBACK E

Mr. Sanders' analysis:

Louis does not have much time to prepare his report, yet he needs accurate, objective, and complete background information on his topic. An encyclopedia is the easiest tool to retrieve and often offers the broadest overview of a subject. Journal articles, although written by specialists, are often too sophisticated for a beginning student such as Louis. And magazine and newspaper articles might present a distorted view to Louis if he does not have the time to read several dozen.

A general encyclopedia alone, such as the ENCYCLOPEDIA BRITANNICA and the ENCYCLOPEDIA AMERICANA, will probably not be as useful to Louis as several of the more highly specialized subject encyclopedias. For instance, I would recommend two subject encyclopedais which are well written and current: THE ENCYCLOPEDIA OF CHINA TODAY and the ENCYCLOPEDIA OF AMERICAN FOREIGN POLICY. When used together, these two encyclopedias will probably give Louis enough information for him to prepare his report. Next time, however, tell Louis to start several weeks in advance of his due dates.

INSTRUCTION F

Louis took Mr. Sander's advice and, indeed, found the material he so badly needed. Louis discovered that despite what he had been taught in high school, basically not to use encyclopedias, that they were truly useful, particularly the subject encyclopedias. As it turned out, upon completion of Louis' oral presentation, his teacher assigned him to expand his oral report into a ten page research paper. Louis already had a solid basis from which to start and the bibliographies that he had found in the encyclopedias would be invaluable now.

PROJECT:

You are in a similar situation to that of Louis--you have been assigned to give a brief oral report in class on a topic which you will than have to expand to a ten page research paper. (Use your research topic for this project.)

a. Select the key words in your research topic. List them.

b. Decided which disciplines your topic involves. List them.

c. Select appropriate encyclopedias (both general and subject) to begin your research.

d. Use your key words to locate articles.

e. Apply the criteria that Louis used to compare information sources to assist you in comparing the information you find in each encyclopedia.

f. Your written report should include (in addition to a. & b.):

   1. which encylopedias you choose for comparison
   2. results of your comaprison based on the criteria
   3. a summary statement indicating whether encyclopedias were helpful in your research
   4. three monographs which look like promising sources
   5. write a correct bibliographic citation for each encyclopedia article you feel will be of assistance in your research

LEARNING THEORY AND LIBRARY INSTRUCTION
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